

**§ 25.1207 Compliance.**

Unless otherwise specified, compliance with the requirements of §§ 25.1181 through 25.1203 must be shown by a full scale fire test or by one or more of the following methods:

- (a) Tests of similar powerplant configurations;
- (b) Tests of components;
- (c) Service experience of aircraft with similar powerplant configurations;
- (d) Analysis.

[Amdt. 25-46, 43 FR 50598, Oct. 30, 1978]

**Subpart F—Equipment****GENERAL****§ 25.1301 Function and installation.**

Each item of installed equipment must—

- (a) Be of a kind and design appropriate to its intended function;
- (b) Be labeled as to its identification, function, or operating limitations, or any applicable combination of these factors;
- (c) Be installed according to limitations specified for that equipment; and
- (d) Function properly when installed.

**§ 25.1303 Flight and navigation instruments.**

(a) The following flight and navigation instruments must be installed so that the instrument is visible from each pilot station:

- (1) A free air temperature indicator or an air-temperature indicator which provides indications that are convertible to free-air temperature.
- (2) A clock displaying hours, minutes, and seconds with a sweep-second pointer or digital presentation.
- (3) A direction indicator (non-stabilized magnetic compass).
- (b) The following flight and navigation instruments must be installed at each pilot station:
  - (1) An airspeed indicator. If airspeed limitations vary with altitude, the indicator must have a maximum allowable airspeed indicator showing the variation of  $V_{MO}$  with altitude.
  - (2) An altimeter (sensitive).
  - (3) A rate-of-climb indicator (vertical speed).

(4) A gyroscopic rate-of-turn indicator combined with an integral slip-skid indicator (turn-and-bank indicator) except that only a slip-skid indicator is required on large airplanes with a third attitude instrument system useable through flight attitudes of 360° of pitch and roll and installed in accordance with § 25.1305(k) of this title.

(5) A bank and pitch indicator (gyroscopically stabilized).

(6) A direction indicator (gyroscopically stabilized, magnetic or non-magnetic).

(c) The following flight and navigation instruments are required as prescribed in this paragraph:

(1) A speed warning device is required for turbine engine powered airplanes and for airplanes with  $V_{MO}/M_{MO}$  greater than  $0.8 V_{DF}/M_{DF}$  or  $0.8 V_D/M_D$ . The speed warning device must give effective aural warning (differing distinctively from aural warnings used for other purposes) to the pilots, whenever the speed exceeds  $V_{MO}$  plus 6 knots or  $M_{MO} + 0.01$ . The upper limit of the production tolerance for the warning device may not exceed the prescribed warning speed.

(2) A machmeter is required at each pilot station for airplanes with compressibility limitations not otherwise indicated to the pilot by the airspeed indicating system required under paragraph (b)(1) of this section.

[Amdt. 25-23, 35 FR 5678, Apr. 8, 1970, as amended by Amdt. 25-24, 35 FR 7108, May 6, 1970; Amdt. 25-38, 41 FR 55467, Dec. 20, 1976; Amdt. 25-90, 62 FR 13253, Mar. 19, 1997]

**§ 25.1305 Powerplant instruments.**

The following are required powerplant instruments:

- (a) *For all airplanes.* (1) A fuel pressure warning means for each engine, or a master warning means for all engines with provision for isolating the individual warning means from the master warning means.
- (2) A fuel quantity indicator for each fuel tank.
- (3) An oil quantity indicator for each oil tank.
- (4) An oil pressure indicator for each independent pressure oil system of each engine.